

DOCUMENT RESUME

ED 080 525

SP 006 823

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TITLE Selected Issues Relating to Available Information on
Health Education Program Needs. Report No. 38.
INSTITUTION Education Commission of the States, Denver, Colo.
PUB DATE May 73
NOTE 24p.
AVAILABLE FROM Education Commission of the States, 300 Lincoln
Tower, 1860 Lincoln Street, Denver, Colorado 80203
(\$2.00)

EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS Community Services; *Health Education; *Health
Programs; Health Services; *Literature Reviews;
*Professional Training

ABSTRACT

This paper identifies and briefly comments on the approaches used for justifying health education program needs for the purpose of educating and training people for the health care professions and occupations. It assesses and evaluates available information concerning the needs of programs that are designed to train and educate professionals for all of the medical and health related services. (JB)

ED 080525

SELECTED ISSUES RELATING TO AVAILABLE
INFORMATION ON HEALTH EDUCATION PROGRAM NEEDS

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Report No. 38
Education Commission of the States
Denver, Colorado
Wendell H. Pierce, Executive Director

May 1973

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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SP 006 823

STATEMENT OF PROBLEM

Assessment and evaluation of the adequacy of available information on health education program needs require a rather succinct definition of "health education program needs." However, developing a clear statement and acceptable definition, acceptable to interested constituencies, of health education program needs is no easy task. Although considerable study, research and commentary has occurred, and is being updated, about health service manpower needs, manpower supply for delivery of health care services and public consumption of all available health services, comprehensive systematic data collection on postsecondary educational programs essentially designed to educate and/or train people for the health service professions and occupations, as well as analysis for the needs thereof, is not abundant. Also, very much in short supply are acceptable and agreed upon approaches for assessing the need for medical and/or health care services. The absence of agreement on approaches to measuring need obviously contributes to the national controversy about the availability and distribution of health care. Because of the absence of agreed upon and viable approaches for assessing need, the development of a sound rationale for justifying health education programs, both current and future, on objective grounds is nearly impossible.

This paper attempts to provide commentary about available information on health education programs, approaches for assessing need and related issue questions.

Illustrating the national concern for the whole range of health information, services and public consumption of services is, for example, the President's Committee on Health Education. Here, health education is being analyzed by a national panel, appointed by President Nixon, from the perspective of what is being done in this country to inform laymen, nonmedical service professionals, on basic personal health attention and needs. Also, recently the National Institutes of Health (NIH) awarded a grant to the American Association of State Colleges and Universities (AASCU) for a two-and-one-half year project "...to assist AASCU institutions in planning new, expanded and/or improved programs for the training and education of needed allied health professionals."¹ In addition, as a part of the same project, through a series of regional workshops, its coordinator, Dr. Moses Koch, plans to provide a forum for aiding interested AASCU institutions in assessing allied health manpower needs and defining their roles in helping to meet those needs.

Moreover, at the national level considerable exposure to the issues of providing adequate health care to all Americans will continue in the Congress. Predictably, the debate will reach a higher pitch as national insurance programs are further considered. Most current will be the debate between Congress and the Administration concerning the Administration's position of cutting back federally instituted financial support of health care related research and services.

At the state level throughout the states, there is little question that public policymakers will be presented with requests for restoring the lost funds supporting research and service health care programs. Health service educators, researchers and service program administrators will be presenting their requests to the legislators and governors throughout the country. Here, as in the Congress the issues will be exposed.

The role of the National Institutes of Health (NIH) as the primary federal agency for initiating, contracting for and conducting health service and research deserves attention.

In 1967, the Bureau of Health Manpower within NIH, as the federal agency with primary commitment to the goal of meeting the nation's health manpower needs, made available a publication entitled *Health Manpower Perspective: 1967*.² Besides pulling together in one source comprehensive data on health services supply, an analysis of needs and a categorical description of the educational components for the health services, the relevant issues of health education programming and needs were identified. The development of better patterns of health manpower utilization is an urgent need according to this report. Put another way, it issued a challenge to public policymakers and educators: that they must provide the health service professionals and technical workers for the meeting of the health needs if the objective of the best possible health services for all America is to be realized. Not only from this report and updated analyses through the Bureau of Health Manpower, but also additional analyses from several independent analysts³ of health services and their consumption, efforts have been made to identify issues and make recommendations for providing the optimum of health care services.

Virtually all the research and analysis on need relating to health education programs indicate that all pipelines in the health education apparatus must produce more professionals and personnel for the related occupations than the current output in the health services industry if the stated objective is to be realized.

For the purpose of this paper, available information on health education program needs, programs in the sense of educational and training activities designed to train and produce professionals for all of the medical and health related services, both in terms of current and future needs, will be assessed and evaluated. A corollary distinguishing characteristic and function of this major conglomerate of the components of the health education apparatus is the on-going development of experimental or scientific medicine and the preparation of manpower therefor. Technical training programs, on-the-job training experiences or the training for support services of the general health services industry, such as clerks, craftsmen and laborers, will not be a part of this paper although they are recognized as important elements in supporting the health services resources. The term health care services, in terms of personnel, in this paper refers to the personnel commonly referred to as physicians, dentists, registered nurses and allied health personnel. The source for this definition is the Bureau of Health Professions Education and Manpower Training, and in the next section of this paper this broad definition is elaborated on.

The remaining sections of this paper are outlined as follows: First, the scope of health education programs; that is, the general apparatus designed to train and educate health care services personnel will be accounted for. Second, the components of the health education programs in the postsecondary education establishment will be spelled out. Next, the methods for determining health care service needs amounting to, in effect, the justification for the health education programs will be analyzed. Then, this paper will turn to the major issues and problems associated with information on health education needs and selected issue questions.

SCOPE OF HEALTH CARE SERVICES TRAINING PROGRAMS

Before reviewing the programs in existence for training manpower for entry into the health services professions, a look at the scope of those currently employed in the health occupations and under what circumstances is in order.

An estimate from the Public Health Service indicates there were 3.5 million persons in all health occupations in 1967. This represents 10 times as many people as the number estimated in the year 1900. A table from the *Health Manpower Source Book*⁴ gives the following breakdown of categories of occupation, number of workers and per cent of workers in 1900 and 1967.

HEALTH OCCUPATION	Number of workers		Per cent of workers	
	1900	1967	1900	1967
All health occupations	350,000	3,515,000	100	100
Physicians	123,000	305,500	35	9
Medical related	60,000	651,300	17	18
Dentists	30,000	98,700	9	3
Dental related	5,000	137,000	1	4
Registered nurses	12,000	659,000	4	19
Other nursing	109,000	1,095,000	31	31
Environmental health engineers, scientists and technologists	11,000	54,500	3	1
Environmental health technicians, assistants and aides		163,500		5
All other		350,500		10

Several observations from this table deserve to be noted. First, one can note the sharp changes in the composition of categories of occupation within the health professions when compared with each other. In 1900, one out of three persons engaged in the health professions was a physician; by contrast, in 1967, only one out of 10 was a physician. Likewise, those in the profession of dentistry increasingly became a smaller proportion of those in the general health care services professions. By contrast, registered nurses gained both in numbers and per cent of workers in the total force. From the Public Health Service report, the categories under health occupation of "all other" refer to those people in health information and communication, library services, mathematical sciences, natural sciences (other than clinical laboratory services and environmental health), social sciences (other than psychology), secretarial and office services, veterinary medicine and vocational rehabilitation counseling. In addition, it should be noted that in fact there were almost one million workers not accounted for in this table, such as clerks, craftsmen and laborers, who support the delivery of health services but whose skills are not primarily in the health field and, following the proposed definition of health care services, would not be included nor would the "all other" categories be included.

Based on the report from the Bureau of Health Professions Education and Manpower Training, the health care services industry might be refined into four major professional/occupational categories of physicians, dentists, registered nurses and "allied health."⁵ The bureau definition of allied health covers those professional, technical and supportive personnel in the areas of patient care, public health and health research who engage in activities that support, complement or supplement the professional functions of physicians, dentists and registered nurses, as well as personnel engaged in organized environmental health activities. Not included in this category, and in effect not to be covered by this paper as health care services, are other components of the broad health industry, those in the professions of pharmacy, podiatry, optometry, veterinary medicine and graduate health personnel.

Among the reasons for giving special attention to the allied health categories as defined is the fact that between 1950 and 1967, the number of people engaged in such professions/occupations tripled from 286,200 to 806,500 according to the Public Health Service. The scope of training programs for professions/occupations in allied health needs review.

An approach for analyzing the training programs offered by the Bureau of Health Professions Education and Manpower Training refines the training programs for allied health occupations first into two broad categories: "at least baccalaureate degrees" and "less than baccalaureate degrees."⁶ In the latter category, the basic preparation could yield an associate degree, diploma or a certificate and, in certain instances, nothing in a tangible sense. In the nontangible category, one could have been trained at a hospital, or other health facility, through an on-the-job training program and, in certain instances, because of critical need for filling a vacancy, for example in a hospital setting, one could have simply been pressed into the occupation without any special training for the position.

Within the allied health occupations one can provide a further refinement by identifying those in medical allied health, dental allied health and nursing allied health. Some writers include environmental health workers who support the activities of engineers, scientists and physicians who deal with problems such as air pollution control, food sanitation, milk inspection, pesticides control and water pollution control, as allied health personnel. Although these important activities are recognized, for the general purpose of this paper, no additional commentary is offered.

M. Y. Pennell reported in "Measuring the Supply of Health Manpower"⁷ the following categories and numbers of personnel in the work force by "at least baccalaureate" and "less than baccalaureate" by occupational category for medical allied health. The range of categories and numbers of personnel may be viewed in the following table format as Pennell reported for 1967.

ESTIMATED EMPLOYMENT IN SELECTED MEDICAL⁸ ALLIED OCCUPATIONS: 1967

Occupations for which the appropriate requirement for basic occupational preparation is at least baccalaureate		Occupations for which the appropriate requirement for basic occupational preparation is less than baccalaureate	
Occupation	Workers	Occupation	Workers
Total	175,000	Total	276,500
Administration:			
Health administrator, program analyst, program representative, systems analyst	26,000	Health administrative assistant	16,000
Biomedical Engineering:			
Biomedical engineer	3,000	Biomedical engineering technician ..	6,000
		Biomedical engineering aide	
Clinical Laboratory Services:			
Clinical laboratory scientist, technologist	44,000	Clinical laboratory technician, aide ..	56,000
Dietetic and Nutritional Services:			
Dietitian, nutritionist	30,000	Dietary technician, aide	6,000
Health Education:			
Health educator	19,800	Health education aide	
Medical Record Services:			
Medical record librarian	8,000	Medical record technician, clerk	29,000
Occupational Therapy:			
Occupational therapist	6,500	Occupational therapy assistant, aide ..	5,000
Orthotic and Prosthetic Technology:			
.....		Orthotist, prosthetist	3,500
		Orthotic aid, prosthetic aide	
		Restoration technician	
Pharmacy:			
.....		Pharmacy aide	5,600
Physical Therapy:			
Physical therapist	13,000	Physical therapy assistant, aide	7,000
Radiologic Technology:			
Radiologic technologist		Radiologic technician	85,000
Specialized Rehabilitation Services:			
Corrective therapist	1,100	Corrective therapy aide	
Educational therapist	500		
Manual arts therapist	900		
Music therapist	2,000		
Recreation therapist	4,000		
Homemaking rehabilitation consultant	200	Recreation therapy aide	
Speech Pathology and Audiology:			
Speech pathologist, audiologist	16,000		
Vision Care and Services:			
Vision care technologist		Vision care technician, orthoptic technician, optician	23,400
		Vision care aide	
Miscellaneous Health Services:			
Physician's associate		Physician's assistant	
Extracorporeal circulation specialist		Physician's aide	19,000
Other		Medical emergency technician	
		Ambulance attendant (aide)	
		Inhalation therapy technician	7,000
		Inhalation therapy aide	
		Medical equipment technician	8,000
		Community health aide	
		Other	

Besides noting those in the work force in 1967 for the medical allied health or profession/occupation categories, a feel for their scope may be noted by observing the educational and training programs for approximately the same time, 1967. Except for slight variations in terminology, two-year and four-year colleges and universities were offering similarly designated majors, such as majors in medical records, medical technology, occupational therapy and physical therapy. Survey reports of college programs then available are noted in the *Health Manpower Source Book*, Appendix tables B-1 through B-13 having been collected by the Bureau of Health Professions Education and Manpower Training.⁹

Before making any additional observations about the scope and trends in medical allied health, the categories and personnel for dental and nursing allied health will be indicated.

The NIH Division of Dental Health reports that in 1970 about 140,000 people made up the work force comprising the categories of dental hygienist, dental assistant and dental laboratory technician. Also, the Division of Dental Health reports the number of programs for training dental auxiliaries in United States colleges and universities more than doubled between 1965 and 1969. And, in terms of graduates, the division estimated 2,852 graduates in 1965 and 5,175 in 1969.¹⁰

The NIH Division of Nursing, Manpower and Analysis and Resources Branch reports an estimated 1,754,000 persons engaged in nursing and related services in 1967. Registered nurses numbered about 659,000; licensed practical nurses, 320,000. The remaining 775,000 includes nursing assistants such as aides, orderlies and attendants employed in hospitals and nursing homes and home health aides (about 12,000) usually employed by public and voluntary agencies. Between 1967 and 1980, based on approved program goals, approved by the nursing profession according to the division, nursing auxiliary personnel will increase from 775,000 to 1,150,000.

There are no specific educational requirements for nursing auxiliaries. Primarily, the training is experienced by on-the-job programs in hospitals and clinics. The content of these training programs varies considerably but includes classroom instruction, demonstration and practice under the supervision of a registered nurse.

It is clear that enormous expansion of the work force and educational program responses at two- and four-year colleges and universities together with on-the-job training programs has occurred in the allied health professions/occupations as defined. Much of this expansion has occurred in the last 5 to 10 years. The basis on which this expansion has occurred is difficult to account for in precise terms, terms which stem from an objective assessment of need. Most likely, specific educational program development resulted from perceived localized need, a concept to be developed later in this paper. A major difficulty for planners, policymakers and educators in assessing need for health education programs has been the absence of a systematically collected data base of information about location of programs for educating and training people for allied health work, enrollment and enrollment capacities. Secondly, although considerable assessment of national supply and estimated needs has been offered by NIH initiated studies, little has been available on regional, state and local levels in terms of location of programs and enrollment data.

An important first step in providing planners, policymakers and educators with more reliable information about allied health programs in existence, their location and data on enrollments has been initiated by publication of two inventories: one by the American Association of Community and Junior Colleges in 1970 and the second by the Association of Schools of Allied Health Professions, a directory for four-year colleges and universities.¹¹ As both authors recognize, there are some gaps in the data collected both insofar as incompleteness and inadequate comparability between the two directories. It should also be noted that both of these efforts were NIH sponsored.

Nevertheless, these directories represent necessary inroads on the general need for development of a data base of potentially comparative information about allied health education at the national, regional, state and local levels. For the three other major components of the health care services, physicians, dentists and registered nurses, much more information is available regarding scope of programs which can be obtained from the respective professional associations. In this paper only a brief mention of scope is offered for these three components. It is assumed that most planners, policymakers and educators are generally aware of the scope of people in the work force and the relative stability of educational programs for physicians, dentists and nurses.^{1 2} While some variations in the education and training program approaches have occurred, such as the school of basic medical sciences program approach at the University of Illinois and some expansion of enrollments in schools of medicine, dentistry and nursing, the changes and expansions in the delivery of health education have not been as dramatic as what is occurring in allied health.^{1 3}

Illustrative of the dynamic changes in the offerings of educational and training programs in the allied health fields are the following data gleaned from the directories.^{1 4}

EDUCATIONAL PROGRAMS OFFERED: GRADUATES NATIONALLY¹⁴
Two-Year Colleges

	1969-70 Graduates	1970-71 Estimated Graduates		1969-70 Graduates	1970-71 Estimated ¹ Graduates
Administrative Services			Nursing Services		
Health administrative assistant	3	19	Home health aide	0	10
Nursing home administrator	2	71	Licensed practical nurse ...	8,168	10,113
Biomedical Engineering and Instrumentation Services			Registered nurse	9,152	12,134
Biomedical engineering technician	21	28	Surgical technician	192	499
Electroencephalographic technician	0	0	Optical and Visual Care Services		
Dental Services			Optician	59	71
Dental assistant	1,721	2,522	Vision care technician	29	20
Dental hygienist	1,034	1,345	Radiological Services		
Dental laboratory technician	202	277	Nuclear medicine technician	12	33
Emergency Services			Radiation therapy technician	0	6
Medical emergency technician	6	8	Radiologic technician	496	972
Laboratory Services			Rehabilitation Services		
Cytotechnologist	19	8	Occupational therapy assistant	171	284
Histology/cytology technician	0	1	Physical/occupational therapy assistant	6	15
Medical laboratory assistant	200	254	Physical therapy assistant ..	71	169
Medical laboratory technician	687	1,086	Prosthetic/orthotic technician	12	16
Medical technologist	12	17	Recreational therapy technician	0	0
Medical Care Assistants					
Inhalation therapists	327	763			
Orthopedic assistant	21	27			
Medical Records and Office Services					
Medical office assistant	1,274	1,485			
Medical records technician	165	329			
Medical secretary	701	959			
Mental Health Psychiatric Services					
Mental health assistant	195	529			
Mental retardation specialist	7	39			
Psychiatric aide	165	304			
Miscellaneous					
Dietary technician	54	81			
Medical photographer	1	6			
Veterinary technician	68	67			

EDUCATIONAL PROGRAMS OFFERED: GRADUATES NATIONALLY¹⁵
Four-Year Colleges and Universities

	1969-70 Graduates	1970-71 Estimated	1975-76 Graduates		1969-70 Graduates	1970-71 Estimated	1975-76 Graduates
Administrative Services				Laboratory Services			
Health planner	10	18	90	Bloodbanking			
Health services				technologist	16	NA	22
administrator	37	78	147	Cytotechnologist	179	154	208
Health services				Histology			
administrator				technician	7	NA	NA
(adv.)	325	447	654	Laboratory			
Health systems				clinician	89	109	188
analyst	37	NA	NA	Medical laboratory			
Hospital unit				assistant	130	153	118
manager	7	16	45	Medical laboratory			
Medical office				technician	26	45	146
assistant	109	116	295	Medical			
Medical records				technologist	3710	4355	7565
librarian	196	217	456	Medical technologist			
Medical records				(adv.)	71	94	252
technician	2	5	41	Medical technology			
Medical				educator	NA	NA	NA
secretary	114	114	230	Toxicologist	NA	NA	NA
Biomedical Engineering and				Medical Care Services			
Instrumentation Services				Child health			
Biomedical				associate	0	9	15
engineer	50	49	151	Medex	14	45	100
Biomedical engineer				Nurse			
(adv.)	77	92	173	anesthetist	66	60	84
Cardiopulmonary				Nurse-midwife	32	48	NA
technologist/				Obstetric			
respiratory				technician	NA	8	NA
therapist	NA	NA	20	Pediatric nurse			
Circulation				practitioner	3	6	12
technologist	0	6	12	Physician assistant-			
Electroencephalographic				anesthesiology	NA	NA	NA
technician	3	6	6	Physician assistant-			
Inhalation				pathology	4	6	22
therapist	130	232	611	Physician Assistant-			
Pulmonary function				primary care	13	29	106
technician	1	1	NA	Physician assistant-			
Dental Services				surgery	2	4	10
Dental assistant	409	470	737	Vision care			
Dental auxiliary				technician	8	43	69
educator	78	127	176	Medical Information			
Dental hygienist	982	1048	1388	Services			
Dental hygienist				Biomedical			
(adv.)	429	465	814	photographer	0	15	36
Dental laboratory				Biostatistician	3	3	41
technician	42	54	64	Biostatistician			
Dental therapist	6	NA	NA	(adv.)	NA	NA	NA
Dietary Services				Medical communication			
Dietary				specialist	2	10	36
technician	29	49	85	Medical computer			
Dietitian/				specialist	3	5	45
nutritionist	1218	1347	2115	Medical			
Dietitian/				illustrator	12	19	24
nutritionist				Medical illustrator			
(adv.)	285	352	588	(adv.)	10	7	13

	1969-70 Graduates	1970-71 Estimated	1975-76 Graduates		1969-70 Graduates	1970-71 Estimated	1975-76 Graduates
Rehabilitation Services (continued)				Music therapist (adv.)	5	15	31
Medical librarian	15	30	NA	Occupational therapist	692	795	1441
Medical writer	4	5	NA	Occupational therapist (adv.)			
Mental Health Counseling Services				Occupational therapy assistant	2	5	35
Alcoholism specialist	0	8	95	Orthotist/ prosthetist	23	32	56
Clinical pastoral counselor	18	17	28	Physical therapist	1318	1661	2522
Genetic counselor	0	9	20	Physical therapist (adv.)	26	40	114
Mental health assistant	58	103	199	Physical therapy assistant	0	1	12
Mental health technologist	43	56	NA	Recreation therapist	73	116	144
Radiological Services				Rehabilitation counselor	585	688	1174
Medical radiation specialist	21	26	47	Rehabilitation counselor (adv.)	11	14	35
Nuclear medicine technician	2	5	10	Speech pathologist/ audiologist	1529	1703	2403
Nuclear medicine technologist	28	39	74	Speech pathologist/ audiologist (pre-master's)	2325	2632	3823
Radiation dosimetrist	NA	NA	NA	Speech pathologist/ audiologist (adv.)	93	75	125
Radiologic administrator/ educator	8	9	53	All Other			
Radiologic technician	779	757	1061	Allied health professions educator	17	18	15
Radiologic technologist	31	85	191	Health educator	480	637	1658
Radiopharmacist	12	10	15	Health educator (adv.)	392	472	897
Rehabilitation Services				Laboratory animal technologist	0	12	76
Art therapist	20	20	20	Laboratory animal technologist (adv.)	3	NA	NA
Corrective therapist	20	31	39				
Exercise physiologist	46	33	59				
Exercise physiologist (adv.)	NA	NA	NA				
Manual arts therapist	4	5	28				
Music therapist	51	69	204				

Certain weaknesses of these two tables need to be pointed out. Both have gaps since full response from all the solicited institutions was not received. Also, some institutional representatives who filled out the questionnaires sent out by the American Association of Community and Junior Colleges and the Association of Schools of Allied Health Professions probably did not understand fully all items of the questionnaire; hence, some responses may be inaccurate. Those types of shortcomings are initially inherent in such a national survey undertaking. But both associations are again in touch with the educational institutions in order to improve the first survey with an updated report.

Even with the shortcomings cited, certain observations may be made of what could be referred to as a representative sample, as a minimum, of allied health educational programs in this country. Immediately the enormous expansion of programs in recent years and the projected increase in the numbers of graduates are noticeable. The consistency of growth in graduates can be noted virtually across the board from health administrative assistant to laboratory animal technologist (adv.). The differences both in terminology of professions/occupations and range of programs offered between the two-year and four-year colleges and universities raise a number of relevant issue questions to be elaborated on in the last section of this paper. Accordingly, it is the purpose of setting forth the above tables in order that one may get a feel for the scope of programs in allied health education.

APPROACHES TO MEASURING HEALTH CARE SERVICE NEEDS

Virtually all writers on the subject of needs for health care services indicate that an increase in the production of trained people for the professions is needed not only to satisfy current demands, but also to cope with projected demands in the immediate future. It is necessary to take a look at some of the more often cited factors indicating a need for increases in the manpower production mechanism, i.e., the health education apparatus for health care services personnel.

The United States Bureau of the Census estimates an increase numerically in the population of this country as well as changes in composition.¹⁶ That is, during the 15-year period from 1965 to 1980, the population of this country is projected to increase by 50 million which would include 5 million more people over the age of 65 and 2 million more babies. (However, a very recent report from the U.S. Bureau of the Census suggests a gradual decline in the population base starting about 1980.) Hence, not only is the general pool of consumers who might draw on health services going to increase considerably by 1980, but also the altering composition of the general population suggests increases for consumption of health services. The elderly draw upon health care services quite heavily, and naturally the medical attention consumed by infants is greater than for the same number of youngsters but at an age level beyond the infant stage. Other factors include the rising income level, especially increases in individual disposable income, a gradual raising of the educational levels of the general public and a greater acceptance on behalf of most Americans that increased and adequate health care is a justifiable national goal. The National Center for Health Statistics cites several factors suggesting greater need¹⁷ These include increasingly longer waiting periods for health care, overcrowded hospital emergency rooms and certain sections within hospitals closed due to lack of staff.

Another factor which has been given considerable analysis is the distribution of health care service resources. A considerable amount of research and analysis has been done indicating the maldistribution of certain services, especially those of physicians. In the discussion below of methods for measuring needs, this will be indicated further. Other general observations about the improper balance between health service demands and resources cite the improper organization of the health care service delivery systems. Clearly on the horizon is the possibility of a national health payment plan. If such a plan comes about, it would increase drastically the need for greater availability of health care services. Although such a plan is in its embryo stage, with considerable debate expected by the Congress, the possible implications and variations of a national payment plan are alarming. For example, if the plan guaranteed each American citizen a minimum of four yearly visits to a dentist, think what that would do to just one facet of the health care services industry and the ratio of resources to services! Concomitant to this potent factor for changing the balance is the increasing public thirst for service. The demand for service on behalf of the general public stems from the increased technological advances in medical science and the greater satisfaction with the array of services currently available to the American consumer. In effect, this has whetted the public's appetite and this may be expected to increase and enhance demand for services.

A legitimate concern for educators, planners and policymakers is whether all that is demanded is in fact needed, and, quite important for the purpose of this paper, is a review of approaches used to assess demand and/or need.¹⁸ Coupled with this is a report on what appears to be a quite promising method for measuring and assessing need, an approach initially developed at the Human Resources Research Center, University of Southern California.¹⁹

Although there exists considerable evidence and agreement that more health care services are needed in terms of resources in order to meet health care demands and needs, possible methods for assessing available services and needs have been given little attention. Moreover, the question of to what extent expanded services are in order seems to be glanced over. And, the selection of a method among the available methods can alter the implications and conclusions drawn from the analysis. These will be explained later with special reference to research conducted at the Department of Health Systems Research and Evaluation, American Medical Association.²⁰ First, though, the general issue of a shortage of services as opposed to a maldistribution of resources needs some attention.

The National Institutes of Health, Bureau of Health Manpower, defines "shortage" as "... the difference between the supply and number needed to meet a minimum standard established by a profession."²¹ (Source: *Health Manpower Perspective: 1967*.) The report adds, however, that this is often above what the community is willing or able to provide. What has occurred then is a ratio comparison of the supply of health care services personnel and the emanating services with a given population base. Secondly, as indicated in the definition, the judgment about a minimum standard comes from the health care services professions with the American Medical Association playing a dominant role. Since virtually all studies indicate a shortage of service, most authors have concluded that many of the problems of health care service resources would be solved by simply increasing the supply of people in the health care professions. But, this argument of simply increasing the supply is not too convincing. Several studies indicate place of training as a positive predictor of where one might take up his or her occupation, in terms of a general geographic location.²² For physicians, place of hospital residency is a sound predictor of where he or she may set up practice. Although the "problem" of improper distribution especially of physicians in the United States has been given considerable exposure, predictably the increase resulting from increasing the supply most likely would not be translated into direct proportional increases of health care providers in those geographical locations suffering from the maldistribution phenomena.

Next, a review of the approaches used in terms of method of measuring supply of health care services and methods for assessing need and demand of services is in order.

One approach is to refine the analysis of supply of health service resources by a breakdown from a national population base to regional, state, county and, a more recently used geographical breakdown, a standard metropolitan statistical area. In fact, much of the research suggesting a maldistribution of resources, especially physicians, has resulted from comparison of population base by area to the available supply of resources. The matter of analyzing available resources with a selected population base, in order to determine whether sufficient services are available, needs a third important input. This input comes from the health care service professions as to whether a minimum standard is satisfied for their respective profession service needs.

Since most political, medical and economic decisions influencing the availability of health care services are made at the state level and because the number of states permits manageable units for cross-national comparison, the state has most often been the population base factor for analysis. Some attention has been given to smaller or local geographical breakdowns in health care service areas. When local areas, in many instances counties, are used, one often observes the maldistribution phenomenon when rural and urban counties are compared. However, the real problem here is defining the health care service unit area. Among the problems relating to this is the fact that health care service consumers do not stay in one geographical area, but in fact are quite mobile.

Another method for measuring the supply of services in use is the categorizing of the services themselves. Possible categories include the range of specialties of the professionals in a given service unit such as a clinic, the organization of the services (private practices versus clinic or hospital) and methods for payment. Although little is being done in terms of such refinement of available services for a given unit of study, more attention to this is needed. Recent studies show that, for example, physicians are devoting more of their time to research and administrative tasks thereby subtracting from patient care contact time.²³ The advantage of analyzing the service by category is that rather than looking at the available resources to a population base, the actual distribution of those resources to a given population base is the source of analysis. Although this approach for analysis is in a quite early stage, the interfacing of health care service resources and their distribution in a given area probably will prove quite fruitful. As might be expected, one of the difficulties here is isolating a health care service area. In talking with staff personnel at the National Institutes of Health, considerable potential exists for using identifiable local trade areas as possible health care service areas. Sources for identifying local trade areas could be the *Commercial Atlas and Marketing Guide of 1971* and *OBE Economic Areas of the United States, 1967*. Another approach for assessing the supply and more so, the distribution of services, would be a direct survey of the consumption of services. Variables within a given health care services facility like a hospital or clinic could be isolated by hours per day devoted to patient contact care and, for example, hours per day rendering the different types of health care services. Although this direct survey approach seems to have some potential, it should be noted that it has been used sparsely. Probably its greatest strength lies in its directness, as suggested by one writer.²⁴

Next, a look at the range of methods for projecting the need for health care service resources at sometime in the future is in order.

The least sophisticated although most often used method for making projections is the establishing of a norm for a component of the health care services industry to a population base and then using a future projection of population to determine whether the norm will be satisfied. An example of this method comes from the Surgeon General's Consultant Group on Medical Education with a report in 1959 which arbitrarily selected the physician-to-population ratio in 1959 as a minimum standard and simply compared future population projections to that standard. Illustrating quite clearly the weakness of this type of approach in view of changing social, economic and medical conditions, is the fact that report projections for the minimum number of physicians for 1975 was in fact met in 1972, while today there is considerable national concern that there is a physician shortage.

A second method for projecting future needs is the requirements approach. First, an estimate of current demand for health care services to current conditions is determined. Next, projections of the numbers of consumers of health care services for a given year, together with projected conditions which might alter the consumption of services, are determined. The third input in the requirements method is an estimate of the amount of services needed based on professional standards provided by the health care service professionals. Given the projections of consumption of services, the predicted conditions which might alter their consumption and the consideration of minimum normative standards, projections are made of what is needed in terms of providing manpower for the health care services to satisfy what is to be required. Obviously, the limitations on this method come from the reliance on estimates and the use of judgments about minimally accepted standards. Some attention has been given to what might be called an economic method of simply assessing the supply and demand of health care services. While it is important to consider the supply and demand factors relating to health care services because of the variation of consumption of services depending on one's ability to pay for services, no attempt is made to

determine minimum need of services in this economics approach. There is no minimum standard of needed health care attention put into the model, and it is here that primarily the economics approach differs from the requirements approach. Only limited study has been conducted on the basis of simply supply and demand.

Considerable hope exists for improvement in the methods of assessment of health care service needs, both current and future, possibly with the further development of a simulation model approach, initiated at the University of Southern California, Human Resources Research Center.²⁶

The essential advantage of approaching the matter of an assessment method in terms of simulation models is the potential for measuring the effects of projected changes in view of the range of variables within the health care service resources presently and the whole range of variables possible at a future date as a result of predicted possible changes in the social, economic and health care conditions. For example, the amount of resources devoted to the cure and prevention of polio in this country far exceeded the national effort to curb drug abuse, at a comparable time, during the '50s and '60s; yet, drug abuse even at that time probably was as crippling to human growth and development, both physically and psychologically, but was not being attacked in the same fashion as polio. Moreover, drug abuse probably was potentially much more damaging to many more Americans than polio. The point is, Americans placed a much higher value in the '50s and '60s on ridding this nation of polio than drug abuse. Only some type of assessment model, programmed for analysis through the use of computers, could possibly provide a "print-out" of measurable responses taking into account all of the related variables which might be reviewed and assessed by planners, policymakers and educators.

Possibly at a national, regional or state level, the considerable expense could be justified for undertaking simulation model assessments. But, at the local community level, at least at most local levels throughout the country, fiscal and staff resources simply could not be justified. However, if the states, at the state level, were to be receiving greater focus for responsibility in providing for adequate health care for their citizenry, a state assessment program might be feasible.

OBSERVATIONS

While considerable work has been done attempting to describe the circumstances affecting the delivery of health care services, the training of manpower to provide health care services and the factors considered in assessing need for health service educational programs, one theme in the literature stands out. There is no agreed upon set of objective criteria for assessing consumer need of health care services. In effect, planners, policymakers and educators have been forced to make decisions and render judgments about health care education programs without systematically collected, statistically validated or potentially comparable information for assessing whether the program can be justified in terms of local, state, regional or national needs. Ideally, it is suggested, every educational program in the postsecondary educational enterprise has resulted from some recognized and justified need. Assessment for recognizing and validating that need has been conducted, at least ideally, through rigorous tests of factors which would include the educational soundness of the programs in terms of a contribution to research, providing a public service or being a contribution to the advancement of instruction in the given educational program. Additional factors would be the assessment of local, state, regional and/or national manpower needs in order to justify the expenditure of funds to support the program, and the assessment of whether the educational enterprise organized to offer the program in fact does have the resources, both material and capable personnel, to offer and maintain the program.

Normative observations of justified need by representative professionals have been the primary source for developing a justification for a particular health care service program along with what this observer would call localized perceived need.

The thrust behind localized perceived need was two-fold. First, Americans wanted more health care service, and second, they were placing a higher value on education and training beyond high school. Moved by the national objective of expanding postsecondary educational opportunity to all Americans who wished exposure to it and would benefit from being a student in some type of postsecondary education, rapid expansion occurred for two-year junior/community colleges and, to a lesser extent, at other colleges and universities. Much of this expansion occurred in the '60s as the states and local communities attempted to carry forward the national objective. With health education program fiscal support receiving high priority at all levels of government, federal, regional, state and local as well as support for new or expanded programs in the colleges and universities, considerable initiation for such programs was occurring locally, such as at the college, department and instructor level. What other factor encouraged this initiation?

Considerable initiation was occurring in the two-year college setting, conducive to allied health education programs. Health care facilities in most communities could offer employment for trained personnel and prospects for future employment looked good with virtually all health care planners and professionals citing current and future shortages of health care professionals. Obvious factors could be cited, including long waiting periods for services such as dental attention, hospital beds closed for lack of staff, overcrowded hospital emergency rooms and inadequate services for children, the mentally ill, the aged and the poor. In addition, instructional personnel for the two-year college program, indeed for all health care educational and training programs could come from the neighboring health care facilities. Under these circumstances, the climate was proper for locally perceived initiated need, especially for allied health education programs, in terms of justifying health care education.

As this paper is being completed, few planners, educators or policymakers recognize fully or suspect all the possible consequences for the development and expansion of health care service educational programs resulting from a changing climate. It has changed suddenly. The federal budget for Fiscal Year 1974, even with the possibilities of minor modifications worked out by Congress, it is suggested, will contribute to a climate of curtailment on the development and expansion of health education programs at all levels.

It is suggested further that in a period of curtailment, the common denominator problem facing planners, educators and policymakers of inadequate criteria for assessing health education program needs will be a more crucial shortcoming in the '70s than in the '60s, a period which was ripe for expansion.

Accordingly, certain key questions should be engaged:

1. Are the federal government, the states or the health care professionals fundamentally responsible for providing adequate health care services to all Americans? Or, if there is a sharing of the responsibility, what are the interrelationships among the federal, state and local levels and the professionals?

2. Among the levels of government, which level is fundamentally responsible for providing the postsecondary educational programs designed to educate and train manpower for entry into the health care service professions?

3. In view of the state's basic responsibility in education, what responsibility does the state have for providing health care opportunities, in terms of postsecondary education and training programs, for those who wish to enter the health care services?

4. In view of the range of possible techniques for assessing and projecting health care services needs, what should be done immediately, if anything, in terms of improving the approaches for assessing health care education needs in order that planners, educators and policymakers might render judgments on program development, expansion or retrenchment?

5. What shall be the forum of planners, educators, policymakers and health care professionals for engaging these issues and sharing the major responsibilities for providing optimum health care education and training commensurate with justifiable needs?

6. In view of the rapid expansion of allied health, as a component of health care services, compared with other components, on what basis shall planners, educators, policymakers and health professionals enhance or alter that direction, especially in relation to providing education and training programs for allied health?

FOOTNOTES

¹ American Association of State Colleges and Universities, Ond Dupont Circle, Washington, D.C. 20036: Circulated Memorandum to Member Institutions. Date, November 6, 1972, from Allan W. Ostar, Executive Director.

² Public Health Service, *Health Manpower Perspective: 1967*. Publication Number 1667, U.S. Government Printing Office, Washington, D.C.: 1967.

³ Although several sources are cited in the "Selected References" portion of this paper, attention is called to the following works:

—Bruce Steinwald, *Approaches to Measuring the Availability of Medical Services* (American Medical Association, Center for Health Services Research and Development, January, 1973. Mimeographed).

—J. Haug, G. Roback, and B. Martin, *Distribution of Physicians in the United States, 1970* (Chicago: Center for Health Services Research and Development, American Medical Association, 1971).

—Fashi Fein and Gerald I. Weber, *Financing Medical Education: An Analysis of Alternative Policies and Mechanisms* (New York: David McKay Company, 1971).

—N. Jones, C. Struve, and P. Stefani, "Health Manpower in 1975—Demand, Supply, Price" *National Advisory Commission on Health Manpower, Report Vol. II* (Washington, D.C.: U.S. Government Printing Office, 1967) Pp. 73-100.

⁴ *Health Manpower Source Book 21. Allied Health Manpower Supply and Requirements, 1950 to 1980* (Washington, D.C.: U.S. Government Printing Office, 1970). P. 3.

⁵ *Ibid.*, Pp. 31-35.

⁶ *Ibid.*

⁷ M. Y. Pennell, "Measuring the Supply of Health Manpower" *Health Manpower, United States, 1965-1967*. Public Health Service Publication No. 1000, Series 14, No. 1 (Washington, D.C.: U.S. Government Printing Office, 1968.)

⁸ *Ibid.*, based on Table I.

⁹ *Health Manpower Source Book*, op. cit.

¹⁰ Public Health Service estimates.

¹¹ *Allied Health Education Programs in Junior Colleges/1970*, compiled by American Association of Junior Colleges, DHEW Publication No. (NIH) 72-163; and, *Allied Health Education Programs in Senior Colleges/1971*, compiled by Association of Schools of Allied Health Professions, DHEW Publication No. (NIH) 73-241.

¹² See for example: J. Haug, G. Roback, B. Martin, *Distribution of Physicians in the United States, 1970* (Chicago: Center for Health Services Research and Development, American Medical Association, 1971) or, U.S. Bureau of Labor Statistics, *Health Manpower 1966-1975. A Study of Requirements and Supply* (Washington, D.C.: U.S. Government Printing Office, 1967).

¹³ The College of Medicine of the University of Illinois at the Medical Center initiated, about five years ago, expansion of its basic medical education and training programs to locations away from the Chicago metropolitan area. For information, one might wish to contact the Office of the Chancellor, University of Illinois at the Medical Center, Chicago.

¹⁴ *Allied Health Education Programs in Junior Colleges/1970*, op.cit.

¹⁵ *Allied Health Education Programs in Senior Colleges/1971*, op.cit.

¹⁶ U.S. Bureau of the Census, "Current Population Reports," Ser. P-60, No. 53. 1967; No. 59, 1969.

¹⁷ National Center for Health Statistics: National Institutes of Health, U.S. Department of Health, Education, and Welfare, NIH 71-747 (Washington, D.C.: U.S. Government Printing Office, 1971).

¹⁸ See for example: A. Williams, H. Wechsler, and F. Garfield, "Dental Manpower in an Urban Area," *Medical Care*, July-August, 1969, Vol. VII, No. 4; or Henry R. Mason, "Manpower Needs by Specialty," *Journal of the American Medical Association*, March 20, 1972, Vol 219, No. 12; or J. Jeffers, M. Bognanno, and J. Bartlett, "On the Demand Versus Need for Medical Services and the Concept of Shortage," *A.J.P.H.*, January, 1971, Vol 61, No. 1; or Henry Wechsler, "Shortages in Dental Manpower: A Problem of Maldistribution," *Journal of Dental Education*, January, 1972, Pp. 77-83.

¹⁹ D. Yett, et al., *The Development of a Micro-Simulation Model of Health Manpower Demand and Supply* (California: Human Resources Research Center, University of Southern California, Research Institute for Business and Economics, August 1970).

²⁰ *Approaches to Measuring the Availability of Medical Services*, op.cit.

²¹ *Health Manpower Perspective: 1967*, op.cit.

²² H. Mechsler, D. Thum, and A. Williams, *Choice of Practice Location: The Influence of Dental School Location and Residence at Admission* (Boston: The Medical Foundation, Inc., 1972).

²³ B. Senior and B. Smith, "The Number of Physicians as a Constraint in Delivery of Health Care," *Journal of the American Medical Association*, October 9, 1972. Also see: F. Sloan, "Lifetime Earnings and Physicians' Choice of Specialty," *Industrial and Labor Relations Review*, Vol. 247, 1970. Pp. 47-56.

²⁴ *Approaches to Measuring the Availability of Medical Services*, op.cit.

²⁵ *The Development of a Micro-Simulation Model of Health Manpower Demand and Supply*, op.cit.

SELECTED REFERENCES

- Allied Health Education Programs in Junior Colleges/1970.* Compiled by American Association of Junior Colleges. DHEW Publication No. (NIH) 72-163. Washington: U.S. Government Printing Office, 1971.
- Allied Health Education Programs in Senior Colleges/1971.* Compiled by Association of Schools of Allied Health Professions. DHEW Publication No. (NIH) 73-241. Washington: U.S. Government Printing Office, 1971.
- American Medical Association Directory Report Service. Chicago: American Medical Association. (Good for annual update of count on those actively working in medical services.)
- The Capitol and the Campus: State Responsibility for Postsecondary Education.* Carnegie Commission on Higher Education. San Francisco: McGraw-Hill, 1971.
- Computer Simulation of Hospital Discharges.* Horvitz, D. Report of the National Center for Health Statistics, Series 2, No. 13, U.S. Department of HEW. Washington: U.S. Government Printing Office, February 1966.
- A Computer Simulation Model for Evaluation of the Health Care Delivery System.* National Center for Health Services Research and Development, U.S. Dept. of HEW. June, 1970.
- Current Population Reports, U.S. Bureau of the Census. Washington: U.S. Government Printing Office.
- "Dental Manpower in an Urban Area," Williams, Allan F., et al. *Medical Care*, Vol. VII, No. 4, July-August, 1969. Pp. 288-294.
- The Development of a Micro-Simulation Model of Health Manpower Demand and Supply.* Yett, D., et al. Human Resources Research Center of the USC Research Institute for Business and Economics. USC: August, 1970.
- Distribution of Physicians in the United States, 1970.* Haug, J.; Roback, G.; and Martin, B. Chicago: Center for Health Services Research and Development, American Medical Association, 1971.
- "The Doctor Shortage: An Economic Diagnosis." Fein, Rashi. Washington: The Brookings Institute, May 1967.
- "Education for the Allied Health Professions and Services," Public Health Services Publication No. 1600. Allied Health Professions Education Subcommittee of the National Advisory Health Council. Washington: U.S. Government Printing Office, 1967.
- "Factors Affecting the Relationship Between Family Income and Medical Care Consumption." Anderson, R., and Benham, L. *Empirical Studies in Health Economics*. Johns Hopkins Press, 1970. Pp. 73-100.
- Financing Medical Education: An Analysis of Alternative Policies and Mechanisms.* Fein, Rashi and Weber, Gerald I. New York: McGraw-Hill, 1971.
- The Gerber Report.* Gerber, Alex. New York: David McKay Company, 1971
- Guidelines for the Development of New Health Occupations.* American Medical Association. Chicago: American Medical Association, 1969.
- "Guidelines for Development of New Health Occupations," Points, Thomas C. Chicago: *Journal of the American Medical Association*, No. 7, 1970.
- "The Health of the American People." Linder, Forrest E. *Scientific American* 214:21-29. June, 1966.
- Health Manpower in Hospitals.* Division of Manpower Intelligence Reports No. 1. National Institute of Health. Washington: U.S. Government Printing Office, 1970.

- Health Manpower Perspective: 1967*. Public Health Service Publication No. 1667. Washington: U.S. Government Printing Office, 1967.
- "Health Manpower in 1975—Demand, Supply, Price." Jones, N.; Streve, C.; and Stefani, P. In National Advisory Commission on Health Manpower. *Report Vol. II*. Washington: U.S. Government Printing Office, 1967. Pp. 73-100.
- Health Manpower Source Book 21. Allied Health Manpower Supply and Requirements, 1950 to 1980*. Washington: U.S. Government Printing Office 1970.
- "Health Resources Statistics: Health Manpower, 1965." Public Health Service Publication No. 1509. Washington: U.S. Government Printing Office, 1966.
- Health Resources Statistics*. Report from the National Center for Health Statistics, DHEW Publication No. (HSM) 72-1509, 1971 Education.
- Higher Education and the Nation's Health: Policies for Medical and Dental Education*. A special report and recommendations by the Carnegie Commission on Higher Education. New York: McGraw-Hill, October 1970.
- "Inventory of Education Outcomes and Activities." Western Interstate Commission for Higher Education. Boulder: WICHE, 1971.
- Manpower Needs for National Goals in the 1970s*. Lecht Leonard A. New York: Praeger, 1969.
- "Manpower Needs by Specialty." Mason, Henry R. *Journal of the American Medical Association*, Vol. 219, No. 12, March 20, 1972.
- "Manpower Resources in Hospitals—1966-1975." American Hospital Association, 1966.
- "Manpower Report of the President." U.S. Department of Labor. Transmitted to the Congress, April, 1967. *Manpower Research Bulletin No. 14*. Washington: U.S. Government Printing Office, 1967.
- "Measuring the Supply of Health Manpower." Pennell, M. Y. *Health Manpower, United States, 1965-1967*. Public Health Service Publication No. 1000, Series 14, No. 1. Washington: U.S. Government Printing Office, 1968.
- "Medical Education in the United States, Section V, Education Programs in Areas Allied to Medicine," *Journal of the American Medical Association*, No. 9, 1968.
- "Medical Manpower: A Multi-Variate Analysis of the Distribution of Physicians in Urban United States." Joroff, S. and Navarro, N. *Medical Care* 9:428-438, 1971.
- "The Medical Manpower Shortage." Gerber, Alex. *Journal of Medical Education* 42:306-319. April, 1967.
- "Migration, Location and Remuneration of Medical Personnel: Physicians and Dentists." Benham, L.; Mauriz, A.; and Reder, M. *Review of Economics and Statistics*, August, 1968. Pp. 332-347.
- National Commission on Community Health Services. Task Force on Health Manpower. *Health Manpower: Action to Meet Community Needs*. Bethesda, Md.: The Commission. Public Affairs Press, 1967.
- 1971 Commercial Atlas & Marketing Guide, 102nd Edition*. Chicago: Rand McNally & Company, 1971.
- OBE Economic Atlas of the United States*. Washington: Office of Business Economics, Department of Commerce, 1967.
- Physicians for a Growing America*. Bane, F., Chairman, Surgeon General's Consultant Group on Medical Education. Public Health Services Publication No. 709. Washington: U.S. Government Printing Office, 1959.
- "Physician Migration: A Problem in the Upper Midwest." Fahs, I.; Ingells, K.; and Miller, W. *Journal of Medical Education* 43:735-740, June, 1968.
- "Physicians' Views of Medical Practice in Nonmetropolitan Communities." Bible, B. *Public Health Reports*. January, 1970. Pp. 11-17.
- Reference Data on Socioeconomic Issues of Health, 1971*. Chicago: American Medical Association, 1971.

"Study of Accreditation of Selected Health Educational Programs, Part 1—Staff Working Papers." Selden, William K. National Commission on Accreditation, October, 1971.

Towards a Policy for the 1970's: A White Paper. U.S. Department of Health, Education and Welfare, May, 1971.

"Towns Without Physicians and Towns with Only One—A Study of Four States in the Upper Midwest." Fahs, I., and Peterson, O. *American Journal of Public Health* 58:1200-1211, July, 1968.

U.S. Department of Health, Education, and Welfare. Public Health Service, Bureau of Health Manpower.



The Education Commission of the States is a nonprofit organization formed by interstate compact in 1966. Forty-seven states and territories are now members. Its goal is to further a working relationship among state governors, legislators and educators for the improvement of education. This report is an outcome of one of many Commission undertakings at all levels of education. The Commission offices are located at 300 Lincoln Tower, 1860 Lincoln Street, Denver, Colorado 80203.